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The Training of School-leavers

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Contents

Summary

This research memorandum deals with the determinants of training of school-leavers in the Netherlands. Two different sorts of training are compared: industrial training and apprenticeship ('dual' education). Because industrial training can be considered as a form of firm-specific training and apprenticeship as a form of general training, the two forms of training have entirely different functions. Apprenticeship is mainly an alternative educational track for school-leavers from Junior Secondary Vocational Education while, for school-leavers, industrial training serves mainly as a substitute for any deficiencies in their skills.

1 Introduction

People spend a quarter of their lives at school, but learning doesn't stop when they leave. For both organisations and individuals, 'permanent education' is gradually becoming the normal state of affairs. In some cases work itself offers plenty of opportunities to learn, and in other cases training is given outside the immediate working environment. This training can have various functions, ranging from complete retraining (e.g. as a result of occupational mobility), through further training because skills have become obsolete, to training to help an employee master a new function. The last of these is particularly important for newcomers to the labour market. An analysis of the training which accompanies the entry of school-leavers to the labour market will highlight the match between the skills which are demanded in the labour market and the skills which are acquired during initial education. This will have implications for the question of what skills should be, or should not be, incorporated in initial education.

In relation to this question of the scope of initial education, it is interesting to consider the alternatives to regular education, which is industrial training and apprenticeship. This research memorandum focuses first of all on the determinants of training participation of labour market entrants: what determines the probability that a school-leaver will receive training after leaving initial education? Are initial differences in human capital investments reduced or actually increased by further training? And is the main function of training to compensate for deficiencies in initial education, or does it in fact build on the skills acquired in the education system?

This research memorandum examines the determinants of training for school-leavers from Junior Secondary Vocational Education (VBO), Short Senior Secondary Vocational Education (KMBO), Senior Secondary Vocational Education (MBO) and General Secondary Education (AVO).[1] Two different forms of training for this group of school-leavers can be differentiated. On the one hand, there is industrial training, including both *external courses* and *in-company training,* but excluding informal on-the-job training. On the other hand, there are various types of *apprenticeship (dual education)*. These two forms of training differ in several respects.

Training through an apprenticeship is an important alternative for school-leavers from Junior Secondary Vocational Education who do not want to continue with full-time education, but do want to obtain further qualifications. Such training normally implicates a training-employment contract, that is a combination of one or two days per week of

1. See Appendix 1 for a description of the Dutch educational system.

vocational training and paid work in an occupation which is relevant to the training. Most types of apprenticeship last nominally for 2 years. In contrast, industrial training is much more diverse, in both structure and intensity. This form of training can vary from a two-day course in word processing to specialized internal training for a bank.

The two types of training differ in another important respect. Dual education has always been strongly focused on particular occupations and employment in particular branches, which means that the qualifications can be utilized in various organisations. In contrast, industrial training, generally contains a firm-specific element, which means that the training provided has little or no value outside the firm. The two types of training also differ with respect to the transparency of the qualifications which are acquired. Training under the apprenticeship scheme has a long tradition, and regulations and interventions by the government and national supervisory bodies establish curriculum standards and provide that the examination systems, awarding of certificates, and the provision of information all take place at a national level. In contrast, this transparency is largely lacking with respect to the enormous and varied supply of industrial training. Employers will therefore find it difficult to evaluate the merit of industrial training which potential employees have taken.

This research memorandum will examine whether the differences between the two forms of training which have been outlined above also lead to differences in the determinants of these forms of training.

2 Theoretical framework

When analysing the determinants of training, it is important to distinguish between two important functions of training. First, training can be considered as an investment in human capital, sometimes building on the skills which have already been acquired during initial education. And second, training can have a function in bridging any gaps which may exist between the skills which are demanded and those which employees possess. In theoretical terms, these functions correspond to two theoretical approaches, which overlap to some extent: the human capital theory and the matching theory. The theories can be said to overlap because training to supplement skills may also have the character of an investment. Nevertheless the two theories model two different ways of looking at training.

The central principle of the *human capital theory* is that the skills which are acquired in training represent human capital, which is valued by employers because it leads to higher productivity. This higher productivity will be manifest in higher wages (Becker, 1975). This also shows that education and training are investments. Relevant short-term expenditure

can generate a 'cash flow' in the long term. As with other investment plans, it is possible to carry out cost-benefit analyses, for example the internal rate of return (Psacharopoulos, 1987).

Employers will train their workers if the expected rate of return from the investment in training is higher than the alternative rate of return for investments with a similar risk (for example, the market interest). Of course, the expected rate of return on training is dependent on the training costs, but also on the investment horizon, the increase in productivity and the increase in wage costs. Two factors are very important in determining the increase in wage costs: how firm-specific and how transparent are the resulting qualifications. Firm-specific qualifications are defined as those which have a value only within the firm itself (Becker, 1975; Hashimoto, 1981), while transparent qualifications are those whose value can be estimated by people outside the firm without incurring evaluation costs (Katz & Ziderman, 1990). Firms only have an incentive to invest in training which produces firm-specific and/or non-transparent qualifications ('specific training'), since in that case the increase in productivity is not entirely captured by the employee (through the necessary wage increase). Where training is not firm-specific, and competitors can form an opinion about the value of the training without evaluation costs ('general' training), an employer will have no financial interest in training personnel.[2]

Employees can also decide to invest in training, and according to the human capital theory they will do so if the expected rate of return on the investment is higher than the alternative rate of return with an equal risk. The balance of the benefits (in higher wages) and training costs over the whole investment period produces an internal rate of return which is compared with an alternative rate of return. If the training yields qualifications which have some value outside the firm, and which can also be evaluated by other firms without evaluation costs, the increase in productivity will necessarily lead to an equally large increase in wages. The employee then bears the costs and receives the benefits.[3] Where the training is not *entirely* specific or *entirely* general, the employer and employee have a joint interest, which will be expressed in shared costs and shared benefits.

It was said in the introduction that apprenticeship can be regarded as training which produces qualifications which are transparent and not firm-specific (i.e., 'general' training), while industrial training produces firm-specific and non-transparent qualifications (i.e., 'specific' training). If this assumption is valid, one would expect that the effects on wages of

2. Stevens (1994) however also points at the incentives firms may have to invest in general skills.

3. Ritzen (1991) highlights the fact that individuals find access to the capital market more difficult and are also more risk-averse, so that the threshold value, or the best alternative rate adjusted for risk differences, is higher, which can lead to under-investment in general training.

apprenticeship or industrial training would be different. In the case of general training, the employee will be the investor, so the training costs will be born by the individual. If the employer does incur training costs they will be completely passed on to the employee by lowering the wages, because the employer has no stake in this sort of training. In the case of specific training, these costs cannot be passed on since the employer is now the investor. There is empirical support for this hypothesis (Van Smoorenburg & Van der Velden, 1995a). School-leavers from full-time initial education who undertake apprenticeship earn on average 13% less than school-leavers who are not in apprenticeship, after controlling for variables like age and educational level. Thus one might say that these students invest an average of 13% of their gross wage in general training, in the expectation of earning it back in the long term. No such lowering of the gross hourly wage was observed for those following industrial training. In the case of entirely specific training, the employer will have to bear the training costs without being able to pass them on to the employee.

If apprenticeship can indeed be considered as a form of general training, and industrial training more as a form of specific training, then the determinants of training will also differ.[4] The determinants of general training will derive from the behaviour and interests of the employee, and the determinants of specific training will derive from the behaviour and interests of the employer, since these two kinds of investments are made by the employee, and by the employer, respectively. Furthermore, since apprenticeship requires investments over a longer period than most industrial training, one would expect that the effects of these determinants would generally be stronger for apprenticeship.

A number of hypotheses can now be formulated with respect to the determinants of school-leavers' training. These hypotheses are derived from the nature of the training (general versus specific) and the expected costs and returns of the investment in training.

One significant factor in determining the costs of training, for both individuals and employers, is the time needed to acquire new skills. Therefore the costs of both specific and general training will be lower for individuals with a greater learning ability, as indicated by the educational level they have attained. The ratio between the costs and benefits of training is thus more favourable for those with higher education than for those with lower-level education, which leads to the following hypothesis:

(1) A higher educational level increases the probability of training.

4. This does not however exclude the possibility that apprenticeship training may sometimes have a firm-specific component, and *vice versa,* that industrial training can have a general component. As mentioned above, this will lead to shared costs and shared benefits.

Extensive empirical research has shown that large organisations train their personnel much more intensively than small organisations (CBS, 1995). This may be partly due to economies of scale when purchasing, or providing training. In the case of in-company training, the fixed costs of training (for example the management and the premises for a training department) can be spread over a large number of employees, and in the case of out-company training it will be possible to obtain a discount for quantity. In addition, the 'pooling' of the training risks will produce a lower risk on the total investment.[5] If the costs of training are to be met by employees, as in the case of general training, the size of the organisation will have no influence on the probability of training, because the characteristics of the organisation are in that case irrelevant.

(2) The larger the organisation, the higher the probability of employees participating in industrial training. In contrast, the size of the organisation will have no effect on the probability of undertaking apprenticeship, as it is expected that the workers themselves bear the costs of this general training.

The investment horizon is particularly important in determining the expected returns on the investment. For a given level of training costs, and given training benefits per period (change in productivity minus change in wages), the shorter the (expected) investment horizon is, the lower the net present value and internal rate of return on the investment will be. For specific training, an employer will therefore be less likely to train part-time employees, since the training will be utilized and made to pay over fewer future working hours, and will also be less likely to train employees with a temporary contract, because of the higher risk that such employees will leave.

(3) Employees working under part-time contracts are less likely to participate in industrial training.

(4) Employees with a permanent contract are more likely to participate in industrial training.

Not the actual investment horizon, but rather the subjectively *expected* investment horizon determines the training investments. Employers who expect women to withdraw from the labour market will calculate a lower expected internal rate of return for women (see also Groot, Schippers & Siegers, 1988). This expectation is based on the average labour market behaviour of women (Green, 1993). This can lead an employer to be less ready to invest in specific training for women. Individual women who are deciding whether to invest in general training also make an estimate of their investment horizon. One difference between their decision and the expectations of the employer is the fact that an employer is interested in how long a trained employee can be expected to remain within the employer's own

5. Ritzen (1991) makes a similar point, by suggesting that the inability of individuals to 'pool' their training risk leads to under-investment in general training.

organisation, whereas employees will base their decision on how long they expect to remain in the labour market. Female employees who expect to leave employment, either permanently or for a number of years, will therefore be less ready to invest in general training.

(5) Women have a lower probability of both industrial training and training under the apprenticeship scheme than men.

In the analysis above, training has been considered mainly as a form of investment in human capital, and this training can be either general or firm-specific. But training can also, and simultaneously, serve the function of bridging differences between an individual's skills and the skills which are required. This aspect of training is most explicitly discussed in the *matching theory*. According to this theory, a mismatch between the required skills and the skills a worker actually possesses has important consequences for productivity, wages, the probability of an employee leaving, and so forth. Variations in the quality of the match (by level and field of study) will therefore lead to differences in the need for additional training (Barron, Black & Loewenstein, 1989). If the educational *level* which is required for a particular job is lower than the educational level of the person holding that job, this is known as overeducation (or underutilization), and if the educational level required for the job is higher than the educational level of the worker concerned this is termed undereducation (or overutilization). According to matching theory, undereducation will lead to a greater need for further training in the form of industrial training, while overeducation means that there is less need for training.

(6) Overeducation will lead to a lower probability of participating in industrial training, while undereducation will result in a higher probability.

In addition to the effect of the educational level of a worker, the match between the employee's *field of education* and the field of education which is required for the job is also relevant. According to matching theory, if the field of the employee's education corresponds to the field which is required, the need for further training in the form of industrial training will be less, and *vice versa*.

(7) Employees with jobs within the field in which they studied will have a lower probability of participation in industrial training and reversely employees with a job outside the field in which they studied will be more likely to participate in industrial training.

Types of education also vary in the scope of the occupational field for which they prepare (De Grip & Heijke, 1989). Some types of education prepare students for a narrow occupational domain (for example, Senior Secondary Vocational Education for pharmacy assistants), while others prepare for a broad occupational field (for example, Senior Secondary Vocational Education in mechanical engineering). If school-leavers from a

'narrow' type of education find work in their own field, the need for supplementary training will presumably be less than for people with a 'broad' education working in their own field. However, if school-leavers from a 'narrow' type of education find employment outside the field in which they studied, the need for training (i.e., retraining) will be even higher.

(8) School-leavers from a 'narrow' type of education who find work in their *own* field are less likely to participate in industrial training than a comparable group of school-leavers with a 'broad' education. However, if they find work in a *different* field to that in which they were educated they are more likely to participate in industrial training.

3 Data

The data which have been used to answer the research questions come from the annual RUBS'[6] survey which records the flows of school-leavers and their destinations in the labour market. The RUBS survey gives a representative nation-wide picture of young people leaving General Secondary Education, Junior Secondary Vocational Education, Short Senior Secondary Vocational Education or Senior Secondary Vocational Education. The survey is held approximately one year after leaving school.[7]

The data used for this analysis comes from the 1994 survey which records the 1992/93 school-leavers cohort. The present analysis is based on a sub-sample consisting of school-leavers who obtained a certificate, who had paid work for at least 12 hours per week at the time of the survey, were not self-employed or working in a business belonging to their parents or partner and were also not participating in full-time further education. Those who did not satisfy these conditions or who had missing values on the variables which were used for the analysis were excluded. This resulted in a sub-sample of 2,985 cases who had studied in 79 different courses.

The indicator of participation in industrial training is the question whether the school-leavers were participating in a course or in-company training at the time of the survey[8] (i.e. in May/June 1994). The school-leavers are also asked whether they were participating in an apprenticeship at the time of the survey.

The following variables have been selected as determinants of the probability of training: gender, ethnic background, educational level, width of education, region in which

6. For "*Registratie Uitstroom en Bestemming van Schoolverlaters*".

7. For a more detailed description of the RUBS survey, see Van Smoorenburg & Van der Velden (1995a) and (1995b)

8. The question excluded hobby courses.

respondents are employed, size of the organisation, branche,[9] part-time work,[10] overeducation or undereducation[11] and the field of study required for the job.[12]

The width of the respondent's initial education has been operationalized as follows. For each of the 79 different fields of study, a Gini-Hirschman coefficient (Sheldon, 1985) was calculated for the dispersion of people with that type of education across the economic subsectors and occupational groups. This coefficient is a continuous variable ranging from 0 (if every school-leaver finds employment in the same economic sub-sector, or in the same occupational group) to 1 (if school-leavers are evenly dispersed over all economic sub-sectors or occupational groups, respectively). The width of each type of education is determined as the average of the dispersion across economic sub-sectors and the occupational dispersion (the correlation between these two is 0.79).

4 Results

At the time of the survey, 20% of the school-leavers were participating in industrial training, and 29% were participating in apprenticeship. Since it is very rare for school-leavers to participate in both types of training simultaneously, the two percentages can almost be added together to yield an overall rate of participation in training for school-leavers (47%).

Table 1
Estimation results for the probability of participation in industrial training, and the probability of participation in apprenticeship.

	Industrial training		Apprenticeship	
	regression coefficient	standard error	regression coefficient	standard error

9. Classified using standard industrial classification (SBI) employed by Statistics Netherlands.

10. Defined as contractual employment for 34 or less hours per week.

11. The school-leavers were asked what educational level was required for their job. This required educational level is compared to the level of the education which they have completed. The various types of education are divided into the following levels: (1) Primary Education (2) Junior Secondary Vocational Education/Junior General Secondary Education (3) Short Senior Secondary Vocational Education (4) Senior Secondary Vocational Education/Senior General Secondary Education/Pre-University Education (5) Higher Vocational Education or higher. If the required educational level is below the employee's actual educational level, this is called overeducation or underutilization, and if the required educational level is higher than employee's actual educational level this is called undereducation or overutilization.

12. This match is determined directly, by asking the respondents whether the required education for their job is in the field in which they studied, in another field, or in no particular field.

Female	-0.14	0.11	-0.64**	0.15
Ethnic minority	-0.48	0.38	-1.12	0.61
VBO/MAVO	-0.54*	0.26	3.50**	0.17
KMBO	-0.74**	0.24	1.75**	0.18
MBO/HAVO/VWO	ref.	ref.	ref.	ref.
Width of initial education	1.09**	0.34	-1.40**	0.39
1 ─ 9 employees	-0.26	0.14	0.28	0.19
10 ─ 49 employees	ref.	ref.	ref.	ref .
50 ─ 499 employees	0.05	0.13	0.57**	0.17
500 or more employees	0.39**	0.13	0.89**	0.17
Northern Netherlands	0.06	0.14	-0.08	0.19
Eastern Netherlands	-0.16	0.13	0.17	0.16
Western Netherlands	ref.	ref.	ref.	ref.
Southern Netherlands	-0.12	0.12	0.35*	0.15
Agriculture & fisheries	0.70	0.41	0.67	0.44
Industry & mining	ref.	ref.	ref.	ref .
Construction	0.29	0.24	0.71*	0.29
Commerce, hotel & catering	0.39*	0.17	0.09	0.23
Transport & communication	0.27	0.27	0.22	0.41
Commercial services	0.88**	0.19	-0.51	0.39
Other services	0.03	0.18	1.41**	0.23
Overeducation	-0.26*	0.11	.	.
Matching level	ref.	ref.	.	.
Undereducation	1.03**	0.34	.	.
Own field of study	ref.	ref.	.	.
Different field	-0.12	0.20	.	.
No particular field	-0.12	0.11	.	.
Permanent contract	0.17	0.10	.	.
Part-time job	-0.09	0.11	.	.
Apprenticeship	-2.14**	0.28	.	.
Constant	-1.92**	0.34	-2.24**	0.36
Number of cases		2.985		2.985
-2 log Likelihood		2.843		2.001

*: p<5%; ** p<1%; . : not included in the model

Thus almost half of the school-leavers were participating in one or other of these kinds of training at the time of the survey.[13]

What are the most important determinants of training? To answer this question, two logistic

13. For the averages and standard deviations of all the variables used, see Appendix 2.

regression equations have been estimated, for the probability of participation in industrial training, and the probability of participation in apprenticeship respectively. The results are shown in Table 1.

Some of the variables which are included in the estimation models have already been discussed in Section 2. These include personal, educational and organisational characteristics, like gender, educational level, the width of initial education and the size of the organisation. The two models also incorporate a number of control variables (ethnic background, economic sector and the region in which the respondent is employed) which have not been explicitly considered in the theoretical framework. In addition, a number of characteristics of the respondent's job are included in estimating the probability of participation in industrial training. These job characteristics (permanent contract, part-time work and required education) are derived from the theoretical framework. These job characteristics are not included when estimating the probability of participation in apprenticeship because no causal relationship can be established between these characteristics and the probability of participation in apprenticeship. In fact, becoming an apprentice entails at the same time starting in a job with specific characteristics.

The *first hypothesis* was that a higher educational level increases the probability of training. This hypothesis is confirmed for the probability of participation in industrial training[14] but not for the probability of participation in apprenticeship. The result as regards industrial training is in line with other empirical studies, which also point to a positive relationship between the educational level of employees and participation in training (see for example OECD, 1991; Allaart *et al.*, 1991).[15] However the fact that educational level has the reverse effect on participation in apprenticeship indicates that this form of training has a very specific place in the Dutch education system.[16] In fact, apprenticeship serves as an alternative educational track, in parallel with Senior Secondary Vocational Education, for those who have completed Junior Secondary Vocational Education and gained a certificate. In contrast, for school-leavers from Senior Secondary Vocational Eduaction, there are hardly courses in the apprenticeship system which will raise their educational level. For them, the most

14. The explanatory variable 'apprenticeship' is included in the model to control for the fact that school-leavers can take the two forms of training simultaneously.

15. After controlling for all other factors in the regression, taking the educational level 'MBO/HAVO/VWO' as a reference, the rates of participation in industrial training are as follows: MBO/HAVO/VWO 27%, KMBO 15%, VBO/MAVO 18% (uncorrected rates were 27%, 17% and 9%, respectively).

16. After controlling for all other factors in the regression, taking the educational level 'MBO/HAVO/VWO' as a reference, the rates of participation in apprenticeship are as follows: MBO/HAVO/VWO 8%, KMBO 33%, VBO/MAVO 74% (uncorrected rates were 8%, 28% and 68%, respectively).

appropriate way to improve their qualifications is to go on to Higher Vocational Education (see also Appendix 1).

The positive relation between organisation size and participation in industrial training, is confirmed in this analysis (*hypothesis 2*), although the differences between small and large organisations are not as large as those found for the whole labour force (CBS, 1995). In very large firms (500 employees or more), school-leavers participate in industrial training significantly more often than in organisations with 10 to 50 employees (the reference group), while in very small organisations (1 to 10 employees) there is a significantly lower probability of participation in industrial training.

It can also be seen from Table 1 that medium-sized organisations (10 to 50 employees) make little use of apprenticeship. Thus the relationship between the size of the organisation and the probability of being an apprentice is U-shaped. These effects of organisation size on the probability of being an apprentice do not correspond with what was expected. In fact, if apprenticeship is considered to be fully transparent and not firm-specific, then organisational characteristics such as size should have no effect on the probability of participation in this sort of training, since the costs will be met not by the employer but by the employee. Yet the size of the organisation does play a role in the probability of being an apprentice, which may indicate that the employer also has a stake in this form of training and that this stake varies with the size of the organisation. This would be true if apprenticeship also has a partially firm-specific character.

The *third hypothesis* stated that employees working under part-time contracts are less likely to participate in industrial training, since the 'life-time' benefits of the new qualifications will be less for such employees. This hypothesis was not confirmed by the estimation results. While the sign of the regression coefficient is negative, its value is very small and not significantly different from zero (see Table 1). The *fourth hypothesis,* that employees with a permanent contract are more likely to participate in industrial training, was also not confirmed by the analysis. Although school-leavers with a permanent employment contract are more likely to participate in industrial training than school-leavers with a temporary employment contract, the difference is not significant.

The fifth hypothesis (women have a lower probability of training participation than men), is clearly confirmed with respect to apprenticeship. Males more often have a status as apprentice than females, even after controlling for other factors such as educational attainment and economic sector.[17] Using the apprenticeship participation rate for men

17. It might be argued that women are less likely to choose educational courses in technical fields, and that apprenticeship is primarily concentrated in the technical sector. This argument

(44%) as a reference, and controlling for all other factors in the equation, produces a female participation rate which is markedly lower, at 29%. For the other kind of training, i.e., industrial training, women are also somewhat less likely to participate in training than men, but here the difference is not significant. This might be because the investment of an employer in industrial training (for example, a word processing course lasting a few days) is less than the investment of an employee who enters an apprenticeship. The relatively modest investment costs for the employer implicate that the expected investment horizon is shorter than the time an employee is expected to remain with the organisation. It is therefore self-evident that the gender effect is greater in the case of participation in apprenticeship than in the case of industrial training.

In outlining the theoretical framework, a number of hypotheses relating to the function of training in bridging differences between an individual's skills and the skills which are required were formulated. *Hypothesis 6* states that someone who has completed a course at a higher educational level than is required for the job (overeducation) will be less likely to participate in industrial training, while undereducation will result in a higher probability. The results in Table 1 show that undereducation and overeducation do indeed have the expected effects on the participation rate of industrial training. Overeducation results in a significantly lower probability of this kind of training, and undereducation in a significantly higher probability. This result is in accordance with Sicherman's (1991) findings.

Table 2
Estimation results of the probability of participation in industrial training in the baseline model, and separately for school-leavers working in a job for which training in their own field, another field, and no particular field, respectively, is required (regression coefficients with standard errors in brackets).

	Baseline model	Own field	Another field	No particular field required
Width of initial education	1.09**	0.85	-2.12	1.94**
	(0.34)	(0.46)	(1.18)	(0.62)
Level:				
Overeducation	-0.26*	-0.15	-0.25	-0.36*

however does not change the results. In the first place, the model already controlls for any differences between economic sectors. In the second place, the negative regression coefficient for the gender variable was not reduced when dummies for field of study were included in the regression.

	(0.11)	(0.16)	(0.55)	(0.17)
Matching level	ref.gr	ref.gr	ref.gr	ref.gr
Undereducation	1.03**	1.29**	0.06	0.84
	(0.34)	(0.49)	(1.19)	(0.60)
Field:				
Own field required	ref.gr	.	.	.
Other field required	-0.12	.	.	.
	(0.20)			
No particular field required	-0.12	.	.	.
	(0.11)			
Other determinants	x	x	x	x
Number of cases	2985	1562	176	1247
-2 Log Likelihood	2843	1512	144	1121

*: p<5%; ** p<1%; . : not incorporated in model
x: gender, ethnic background, educational level, organisation size, region, economic sector, permanent contract, part-time work, apprenticeship, constant (for results see appendix 3)

It is quite possible that the effects of undereducation and overeducation will differ between people who are working in their own field and those working outside the field in which they trained. Table 2 therefore shows separate estimates of the probability of participation in industrial training for school-leavers who work in a job for which training in their own field, another field, and no particular field, respectively, is required. The results show that the effects of overeducation and undereducation on participation in industrial training are more or less the same for those working in their own field, another field, or in a job for which no particular field of study is required. All the regression coefficients have the same sign and the differences between the regression coefficients in the three separate models are not significant. Apparently overeducation lowers the probability of participation in industrial training, while undereducation raises the probability, independent of the match between the field in which a person has trained and the field which is required for the job they hold.

Remarkably, the hypothesis that school-leavers who are working within the field in which they studied would have less need for further training than school-leavers who find work in a field other than that in which they studied (*hypothesis 7*) was not confirmed. This is certainly not in line with the assumption that school-leavers who work within the field in which they have studied would have a comparative advantage, as compared with people who are working outside the field in which they studied. This is all the more surprising as the model controlls for the effects of educational level. We therefore have to conclude that industrial training not only serves to bridge any gaps there may be in individuals' skills, but also has a function in further specialisation. Thus a school-leaver who has a job in the field in which he or she is trained may need somewhat less *job-oriented* training, but will on the other hand undertake more *career training*. The net effect is that one's field of education

has no significant effect on the probability of participation in industrial training.

The narrower a person's initial education has been, the smaller the probability of participation in industrial training (see Table 1). Apparently the need for additional training is smallest if the initial education is already specifically focused on particular economic sub-sectors or occupational groups. *Hypothesis 8* stated that school-leavers coming from a 'narrow' type of education (i.e., a type of education focused on one or a few occupations) and who find work in their *own* field would be less likely to participate in industrial training than a comparable group with a 'broad' education. On the other hand, if they find work in a *different* field to that in which they were educated they would be more likely to participate in industrial training. This hypothesis is confirmed, since there is a positive relationship between the width of the initial education and the probability of participation in industrial training for school-leavers who are working in their own field, but a negative relationship for those school-leavers who are working in a job for which education in some other field is required (see Table 2). For school-leavers who work in a job for which education in some other field is required, a narrow education results in a significantly higher probability of participation in industrial training. Thus those with a broader education need less retraining if they shift to an alternative segment of the labour market than people who have followed a 'narrow' type of education, since their broader qualifications can be utilized in more segments of the labour market. On the other hand those who have been trained for a narrow occupational domain have a training advantage over people with broad education, as long as they can find a job for which that narrow training is required.

Having followed, a 'narrow' type of initial education, i.e., a type of education which focuses on one or only a few economic sub-sectors or occupational groups, also leads to a higher probability of participation in the apprenticeship scheme (see Table 1). This indicates that apprenticeship has an entirely different function than industrial training. While an industrial training has the modest aim to adjust any deficiencies in the skills workers already have, undertaking training under the apprenticeship scheme is clearly an investment for the individual, with the intention of acquiring qualifications at a higher level. Individuals who have already made a clear choice for a specific field of study will be more inclined to invest in that field, not least because this will presumably increase their chance of success in the course.

5 Summary and conclusions

School-leavers' training is a phenomenon of substantial proportions. Some 20 percent of Dutch school-leavers participate in industrial training, and 29 percent follow training under

the apprenticeship scheme, so that almost half of all school-leavers are in training of one or other sort, about one year after their graduation. This research memorandum was focused on the determinants of participation in industrial training on the one hand, and of participation in the apprenticeship scheme on the other hand.

Several hypotheses were formulated on the basis of the human capital theory and the matching theory. The most important findings can be summarized as follows:

(1) As expected, a higher educational level results in a higher probability of participation in industrial training. However, contrary to expectations, the reverse was true in the case of being an apprentice.

(2) As expected, the probability of participation in industrial training is higher in large organisations. In contrast to expectations, the probability of participation in training under the apprenticeship scheme, is not independent of the size of the organisation.

(3) Contrary to expectations, part-timers are not significantly less likely to participate in industrial training than full-timers.

(4) Also contrary to expectations, school-leavers with a permanent employment contract did not have a significantly higher probability of participation in industrial training.

(5) As expected, women have a much lower probability of participation in the apprenticeship scheme, and their probability of participating in industrial training is also lower, although the latter difference is not significant.

(6) As expected, overeducation results in a lower probability of participation in industrial training, and undereducation leads to a higher participation rate.

(7) Contrary to expectations, school-leavers working outside the field in which they studied are no more likely to participate in industrial training than school-leavers working within the field in which they were initally educated.

(8) As expected, school-leavers from a 'narrow' type of education (i.e., a type of education focused on one, or only a few, occupational groups and economic sub-sectors) who work in their own field are less likely to participate in industrial training than school-leavers from broader types of education who are working in their own fields. However, when school-leavers from a narrow type of education are employed in functions for which education in some other field is required, the reverse is true. Both results are in accordance with expectations.

It can be concluded that the apprenticeship is mainly an alternative educational track for students from Junior Secondary Vocational Education who have completed a 'narrow' type of education and want to acquire a qualification in the same field but at a higher level. Individuals who expect to participate in the labour market for only a short time will be less ready to participate in apprenticeship training, as this type of training demands a large

investment. This may well be an explanation for the lower participation rates of training under the apprenticeship scheme for women.

Although it was predicted that organisational characteristics would have no effect on the probability of being an apprentice. It was found that this probability was not independent of factors such as the size of the organisation and the economic sector in which a school-leaver is employed. This result suggests that apprenticeship training cannot be considered as purely 'general' training, but also has some firm-specific features, which accounts for the organisational effects.

As regards the findings with respect to industrial training, we have to conclude that these confirm the expectations related to the *costs* of industrial training (for example, the effects of educational level and the size of the organisation), but that the results do not confirm the expectations with respect to the expected *benefits* of industrial training (i.e., the absence of effects from part-time work and permanent employment contract). This is in accordance with findings from a recent case study of the costs and benefits of industrial training (Van Smoorenburg & Heijke, 1995). The latter study showed that firms do have a clear picture of the costs of industrial training, but no more than very general indications of the benefits of such training, although they are certainly convinced that there are some benefits. The benefit side of industrial training is in fact largely characterized by immeasurability and uncertainty about the productivity of employees once they are trained, and how long the organization will benefit from this productivity.

From a certain point of view, initial education and industrial training can be seen as substitutes. The results of this study do indicate that training not only has a function of investment in human capital, but also serves a function in bridging discrepancies between the skills possessed by the school-leavers and the skills demanded on the labour market. In the first place, it appears that school-leavers who are working in jobs which are below their educational level are trained less. This is an important finding, because as many as one in three of all working school-leavers are over-educated for the jobs they have. Apparently there is an economic rationale for employers' recruiting people who are too highly educated for the job at hand: it reduces training costs. The supplementary character of industrial training can also be seen in the case of school-leavers who find a job at a level higher than that for which they have been trained. Such a situation of formal undereducation does in fact result in a greater need to participate in industrial training.

Another clear indication that industrial training can compensate for deficiencies in initial education can be seen from the effects of the 'width' of individuals' initial education. Having followed a 'narrow' type of education results in less need for supplementary training than

having followed a 'broad' type of education. However this effect only holds for those who find work in the field in which they were trained. The reverse is true for those who have switched to an alternative segment of the labour market. Thus training is a compensation for skill deficiencies especially in the case of those who have completed a 'broad' type of education and work in their 'own' occupational domain, or for those who completed a 'narrow' type of education and hold a job outside their occupational domain.

Remarkably, school-leavers who work in the field in which they were educated are not less likely to be trained than school-leavers who find work in a field other than that in which they were educated. This indicates that the function of industrial training is not only to bridge skills gaps but also to provide for further specialisation or extension of skills which have already been acquired. Apparently, where there is an adequate match between the skills which are required and those which have been obtained, another sort of training comes into play: training which is focused on career development in the internal or external labour market.

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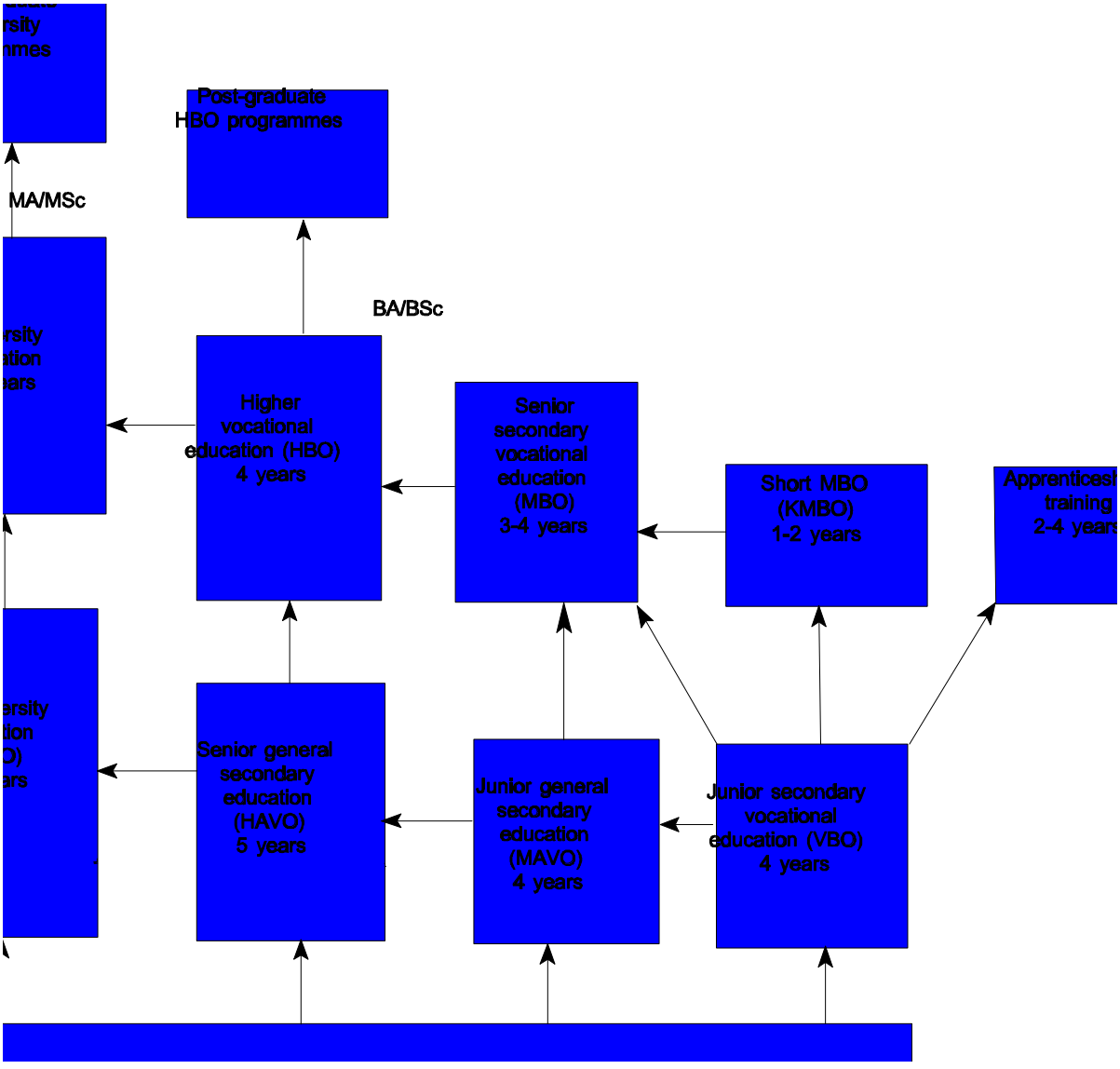
Appendix 1

Dutch educational system

Like most other European countries, a distinction is made in the Netherlands between general and vocational education. As shown in the diagram of the Dutch educational system vocational education ('Beroeps Onderwijs') takes place at three educational levels: the level of junior secondary vocational education (VBO), the level of senior secondary vocational education (MBO) and the level of higher education (vocational colleges (HBO) and university (WO)).



Appendix 2

Averages and standard deviations for all variables.

	Unweighted plus listwise deletion of missing values (for estimates)		Weighted plus pairwise deletion of missing values (for description)	
	average	standard deviation	average	standard deviation
Female	0.71	0.45	0.60	0.49
Ethnic minority	0.02	0.13	0.02	0.13
VBO/MAVO	0.10	0.30	0.30	0.46
KMBO	0.07	0.26	0.14	0.35
MBO/HAVO/VWO (ref.)	0.83	0.38	0.56	0.50
Breadth of initial education	0.70	0.15	0.73	0.14
1 ─ 9 employees	0.21	0.41	0.24	0.43
10 ─ 49 employees (ref.)	0.26	0.44	0.27	0.44
50 ─ 499 employees	0.28	0.45	0.26	0.44
500 or more employees	0.25	0.43	0.23	0.42
Northern Netherlands	0.14	0.35	0.14	0.35
Eastern Netherlands	0.18	0.38	0.19	0.39
Western Netherlands (ref.)	0.44	0.50	0.50	0.50
Southern Netherlands	0.24	0.43	0.17	0.37
Agriculture & fisheries	0.02	0.13	0.04	0.19
Industry & mining (ref.)	0.11	0.32	0.13	0.34
Construction	0.07	0.25	0.10	0.31
Commerce, hotel and catering	0.29	0.45	0.32	0.47
Transport & communication	0.04	0.19	0.05	0.21
Commercial services	0.10	0.29	0.08	0.27
Other services	0.38	0.49	0.28	0.45
Overeducation	0.36	0.48	0.33	0.47
Matching level (ref.)	0.61	0.49	0.61	0.49
Undereducation	0.03	0.16	0.06	0.23
Own field (ref.)	0.52	0.50	0.44	0.50
Other field	0.06	0.24	0.06	0.23
No particular field	0.42	0.49	0.51	0.50
Permanent contract	0.64	0.48	0.59	0.49
Part-time job	0.36	0.48	0.44	0.50
Apprenticeship	0.17	0.38	0.29	0.46
Industrial training	0.22	0.41	0.20	0.40

VBO/MAVO = Junior Secondary Vocational Education and Junior General Secondary Education
KMBO = Short Senior Secondary Vocational Education
MBO/HAVO/VWO = Senior Secondary Vocational Education, Senior General Secondary Education, Pre-university Education

Appendix 3

Estimation results of the probability of participation in industrial training in the basic model, and separately for school-leavers working in a job for which training in their own field, another field, and no particular field, respectively, is required (regression coefficients with standard errors in brackets).

	Basic model		Own field		Another field		no particular field required	
Female	-0.14	(0.11)	-0.15	(0.16)	-1.08*	(0.49)	0.04	(0.18)
Ethnic minority	-0.48	(0.38)	-0.39	(0.44)	#	#	-0.49	(0.79)
VBO/MAVO	-0.54*	(0.26)	-0.32	(0.55)	2.11	(1.33)	-0.73*	(0.32)
KMBO	-0.74**	(0.24)	-0.25	(0.36)	#	#	-0.89**	(0.33)
MBO/HAVO/VWO	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
1-9 employees	-0.26	(0.14)	-0.42*	(0.18)	-0.15	(0.76)	-0.04	(0.23)
10-49 employees	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
50-499 employees	0.05	(0.13)	-0.03	(0.17)	1.54*	(0.67)	0.09	(0.22)
500 or more employees	0.39**	(0.13)	0.20	(0.19)	1.58*	(0.63)	0.54**	(0.21)
Northern Netherlands	0.06	(0.14)	0.05	(0.20)	1.43*	(0.69)	-0.14	(0.22)
Eastern Netherlands	-0.16	(0.13)	-0.11	(0.18)	0.50	(0.63)	-0.32	(0.23)
Western Netherlands	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Southern Netherlands	-0.12	(0.12)	0.07	(0.17)	-0.17	(0.55)	-0.39*	(0.20)
Agriculture & fisheries	0.70	(0.41)	1.15*	(0.59)	#	#	0.35	(0.61)
Industry & mining	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Construction	0.29	(0.24)	0.58	(0.31)	-0.56	(1.36)	-0.13	(0.46)
Commerce & hotel & cat.	0.39*	(0.17)	0.61*	(0.25)	1.75*	(0.91)	0.01	(0.25)
Transport & Communication	0.27	(0.27)	0.18	(0.39)	1.16	(1.45)	0.36	(0.39)
Commercial services	0.88**	(0.19)	0.81**	(0.28)	2.96**	(1.00)	0.71*	(0.30)
Other services	0.03	(0.18)	-0.07	(0.26)	1.80*	(0.91)	0.12	(0.28)
Permanent contract	0.17	(0.10)	0.10	(0.15)	1.06*	(0.52)	0.29*	(0.16)
Part-time work	-0.09	(0.11)	-0.14	(0.16)	0.35	(0.55)	0.04	(0.18)
Apprenticeship/in-service	-2.14**	(0.28)	-2.84**	(0.53)	-1.87*	(1.08)	-2.23**	(0.42)
Constant	-1.92**	(0.34)	-1.70**	(0.46)	-2.49*	(1.22)	-2.63**	(0.60)
Other determinants	x		x		x		x	
Number of cases	2985		1562		176		1247	
-2 Log Likelihood	2843		1512		144		1121	

*: p<5%; ** p<1%; . #: number of cases zero; dummy therefore not incorporated in model
x: width of initial education, required educational level, required field of study (see Table 2 in the main text)